

DPD-7959-59

25 November 1959

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MEMORANDUM FOR:

SUBJECT : Inverter Failures

Following is content of message received this date from IAC:

SUBJ: Inverter Failures UR C-4-13-59-2

1. Failures occur in the electronic control section rather than in the mechanical portion of the inverter.
2. The SE 16-2 Inverters and the SE 16-3 Inverters prior to serial 4906 employ a dual diode vacuum tube in the sensing stage of the voltage control circuit.
3. The SE 16-3 inverter after serial 4906 employs a silicon diode in the sensing stage of the voltage control circuit.
4. Investigation reveals that the inverters in question contained a vacuum tube in the sensing stage and it was this tube or its associated circuitry that failed. This tube is marginal in its operating characteristics.
5. Cause of these failures is unknown, although it appears, from the condition of the inverters, that failure was not due to overload.
6. A recheck of the inverter load analysis, both by calculation and actual test on an article reveals the following:
  - A. The "A" Phase is loaded to 145 VA
  - B. The "B" Phase is loaded to 35 VA
  - C. The "C" Phase is loaded to 60 VA

Giving a total of 240 VA which is 50 VA less than the rated output of the inverter at the altitude and temperature at which it is subjected. The unbalance in load is caused by the autopilot being supplied from the "A" Phase which requires 120 VA for its operation.

7. Before incorporation of SB 393 and 394 (Fuel flowmeter installation) the EPR System was supplied from the "C" Phase and put an additional load of 70 VA on it, making a total of 310 VA for the

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8. The inverter manufacturer recommends that although the inverter can handle the total load, the unbalance of the "A" Phase will cause a more rapid deterioration of the inverter than if the phases were balanced, therefore the replacement time of the inverters should be lowered from 600 hours to 300 hours. This time is actual inverter running time and not necessarily flight hours.

9. The inverter manufacturer informs us that the SE 16-2 or the SE 16-3 inverter is capable of supplying 310 VA continuously providing the inverters are in good condition and to the latest modification.

10. In reviewing UR C-4-13-59-2 the age of the units was from 2 to 5 years, indicating that several overhauls had been made on them.

11. Some of the inverters that have come back for overhaul were original Air Force issue and had been overhauled at AF Depots and had not been brought up to the latest modification at time of previous overhaul.

12. In order to insure that all inverters are up to the latest change, that at overhaul all the latest mods are incorporated, and that overhaul is accomplished at a facility approved by the manufacturer and by us, a control drawing will be issued by us (similar to the flowmeter problem). A service bulletin will be issued requesting inverters be turned around and brought up to the requirements of the control drawing. This service bulletin will be identified as SB 450 and the control drawing will be identified as R 1125.

13. As it is possible to convert an SE 16-2 into an SE 16-3, drawing R 1125 will specify SE 16-3.

14. The Navy has had a similar experience with the SE 16-2 inverters. They have issued electronic material change No. 26-58 to change the SE 16-2 to SE 16-3 with satisfactory results. The SE 16-3 that you will be receiving after this turn-around procedure is in effect, will incorporate the changes outlined in the Navy Change 26-58. END OF MESSAGE

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